

Chinese sources suggest early knowledge of the ‘unknown’ ungulate (*Pseudonovibos spiralis*) from Vietnam and Cambodia

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(With 1 figure in the text)

A survey of historical Chinese encyclopaedias, compilations and textbooks from the Ming and early Qing dynasties (14th to 18th centuries) was carried out for information that might fit an animal from Vietnam and Cambodia which is known only from its distinctive horns. These horns have a raised, rib-like pattern of rings round much of their length, and a backward curl of the horn's tip. One illustrated text found in the *San Cai Tu Hui*, a compilation of knowledge by Wang Chi and his son Wang Si Yi (1607), seems to bear a close resemblance to the information which has recently been gathered during field trips in Cambodia and Vietnam. The authors conclude that additional information on endemic animals in the region may be found in the writings of that part of the world.

Introduction

Recent zoological investigation in Vietnam, Laos and Cambodia has gathered oral, skeletal and horn evidence for the continued presence in the region of a number of medium-sized ungulates previously unknown to post-Linnaean science. Subsequent surveys have permitted the identity of several of these animals to be determined, one from skins as *Pseudoryx nghetinhensis* (Vu Van Dung *et al.*, 1993; Thomas, 1994) and two others from animals held in a zoological collection as species of muntjac deer (Timmins, 1996). A fourth animal, known in Vietnam as Linh Duong and in Cambodia as Kting Sipuoh remains something of a mystery. What very little is known about its size, shape or taxonomy remains largely a mixture of rational conjecture and local folklore (Peter & Feiler, 1994; Dioli, 1996, 1997).

The animal was first remarked upon as a consequence of its distinctive horn structure. The raised, rib-like pattern of rings round much of the length of the horn, and the backward curl of the horn's tip are distinctive and were characters that first attracted attention (Peter & Feiler, 1994; Dioli, 1996). It was also clear from discussion that the older literature of Asia had not been consulted for references to these animals (Dioli, pers. comm.). As a brief contribution to this effort, we have carried out a preliminary examination of the available historical Chinese literature, and in particular have focused on those texts that deal with biological subjects.

Methods

Original and facsimile copies of a number of Chinese encyclopaedias, compilations and textbooks from the Ming and early Qing dynasties (14th to 18th centuries) were consulted for descriptions and illustrations of wild and domestic ungulates. These included the *Yi Yu Tu Zhi* (Chin Hsien, 1489), the *San Cai Tu Hui* (Wang Chi & Wang Si Yi, 1607) and the *Xin Ding Gu Jin Tu Shu Ji Cheng* (Chen Meng-lei, 1726). In

addition, we consulted compilations of Chinese materia medica of the period, together with analyses of their animal content written in European languages (e.g. Read, 1931).

Results

Illustrations and brief descriptions of goat-like animals were found in many of the books and manuscripts consulted. Most of them clearly referred to species present in northern China and Mongolia. However, one illustrated text found in the *San Cai Tu Hui* (Wang Chi & Wang Si Yi, 1607) seemed to bear a closer resemblance to the information which has recently been gathered in Cambodia and Vietnam. The complete page is reproduced in Fig. 1. The text reads:

Ling

It looks like a goat but is larger. Its horns are round and have pointed tips. It prefers to live on cliffs and it uses its horns to hang on a tree off the ground to sleep at night. The horns are thought to have mysterious powers to avoid unlucky things. People in the north hunt and eat this animal. People in the south eat it to avoid snake and insect attack.

Discussion

The information contained in the last part of the text may be interpreted as referring to two animals; one that lives in the north and another that lives in the south. The boundary of China during the lifetime of the compilers of the book extended from Mongolia in the north into Vietnam in the south. Although a broad classification of animals had existed in Chinese literature for a long time, a detailed taxonomy of the ungulates had still to be developed by the time the *San Cai Tu Hui* was compiled. It is not surprising, therefore, that what may prove to be two different, but perhaps related, kinds of animals should share the same illustration.

The shape of the horns and their ribbed pattern is reminiscent of those recently obtained in Vietnam from animals which the local people called Linh Duong or "mountain goat" (Peter & Feiler, 1994), and from Cambodia, where the animals are referred to as Khting Sipu "a kind of horned animal which eats snakes". The geography of the habitat in which the animal lives is clear from the Vietnamese name, and it is possible that the name the Cambodians use carries an echo of the type of association with snakes referred to in the earlier Chinese text.

It is clearly impossible to discuss the animal's taxonomy on the strength of the fragments of information presented above. However, the illustration (Fig. 1) does suggest an animal with anatomical characters that fit aspects of at least three genera of Bovidae; the gazelles (*Procapra* spp.), the gorals (*Naemorhedus* spp.) or the saigas (*Saiga* spp.). It is therefore interesting to note that the gorals seem to prefer precipitous, wooded countryside, and that the horns of the saiga are much prized for their alleged medicinal value in China (Lekagul & McNeely, 1977; Nowak & Paradiso, 1983).

This brief note indicates that, although the animal is not depicted in the appendix of the book *Yi Yu Tu Zhi* (Chin Hsien, 1489) or in the later and much larger encyclopaedia of knowledge, the *Xin Ding Gu Jin Tu Shu Ji Cheng* (Chen Meng-lei, 1726), it may have been depicted in the *San Cai Tu Hui* (Wang Chi & Wang Si Yi, 1607). The same drawing of the animal has been reproduced in the relatively recently published Sino-Japanese dictionary of Chinese characters and phrases (Morohashi Tetsuji, 1957–1960). Perhaps it may not be altogether surprising to find in the early

麕
麕似羊而大角圓
銳好住山崖間夜
宿以角掛木不著
地其角號為有神
故能辟去不祥北
人多食南人食之
能免為蛇蟲所侵



FIG. 1. Photoreproduction of picture 3 in the 'Birds and Animals' section, page 34, of the *San Cai Tu Hui* by Wang Chi and Wang Si Yi (1607) containing the text and illustration of the "Ling".

writings of the region references to other endemic species, the existence of which may have been overlooked with the passage of time (Fèvre & Métaillé, 1993).

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REFERENCES

- Chen Meng-lei (1726). *Xin Ding Gu Jin Tu Shu Ji Cheng*.
 Chin Hsien (1489). *Yi Yu Tu Zhi*.
 Dioli, M. (1996). A clarification about the morphology of the horns of the female kouprey: a new unknown bovid species from Cambodia. *Mammalia* **59**(4): 663–667.
 Dioli, M. (1997). Notes on the morphology of the horns of a new artiodactyl mammal from Cambodia: *Pseudonovibos spiralis*. *J. Zool. (Lond.)* **241**: 527–531.
 Fèvre, F. & Métaillé, G. (1993). Aperçu des sources Chinoises pour l'histoire des animaux. *Anthropozoologica* **18**: 99–103.

- Lekagul, B. & McNeely, J. A. (1977). *Mammals of Thailand*. Bangkok: Sahakarnbhat.
- Morohashi Tetsuji (1957–1960). *Dai Kan-Wa Ci Dian* **12**: 925. Tokyo: Taishukan Shoten.
- Nowak, R. M. & Paradiso, J. L. (1983). *Walker's mammals of the world* **2**. (4th edn). Baltimore: The Johns Hopkins University Press.
- Peter, W. P & Feiler, A. (1994). Hörner von einer unbekannten Bovidenart aus Vietnam (Mammalia: Ruminantia). *Faun. Abh. (Dres.)* **19**: 247–253.
- Read, B. E. (1931). *Chinese materia medica: animal drugs from the Pen Ts'ao Kang Mu by Li Shih-Chen, A.D. 1597*. Peiping, China: Peking Natural History Bulletin.
- Thomas, H. (1994). Cranial anatomy and phylogenetic relationship of the newly discovered bovid (*Pseudoryx nghetensis*) in the annamitic cordillera in Vietnam. *Mammalia* **58**: 453–481.
- Timmins, R. (1996). Another muntjac materialises. *BBC Wildlife* **14**(3): 22–23.
- Vu Van Dung, Pham Mong Giao, Nguyen Ngoc Chinh, Do Tuoc, Arctander, P. & MacKinnon, J. (1993). A new species of living bovid from Vietnam. *Nature (Lond.)* **363**: 443–445.
- Wang Chi & Wang Si Yi (1607). *San Cai Tu Hui*.